INTERNSHIP REPORT

Software Development Engineer - Intern
At
Alorb Technology
Duration : **January 06, 2024** to **June 30, 2024**

Supervised by
Mr.
(Founder, ALORB TECHNOLOGY)
and

(Professor, NIT Kurukshetra)

Prepared by

Aman Goel
12012105
Electrical Engineering
NIT KURUKSHETRA
DECLARATION

I hereby certify that the work which is being presented in this internship report, entitled "Software Development Engineer - Intern at Alorb Technology Labs Pvt. Limited", in partial fulfillment of the requirements for the award of the Bachelor of Technology in Electrical Engineering is an authentic record of my own work carried out during a period from January 06, 2024 to June 30, 2024 under the supervision of -----------------------------, Professor, Computer Engineering Department and Mr. Devilal Sharma (Industrial mentor).

The matter presented in this report has not been submitted for the award of any other degree elsewhere.

_____

(Signature of Candidate)
Devesh Kumar Srivastav (120114017)
Electrical Engineering
NIT Kurukshetra

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

_____

(Signature of Faculty Mentor)

Professor
Electrical Engineering
NIT Kurukshetra

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ABSTRACT

I was hired as a Full stack Developer - Intern at Alorb Technology. It was a smooth internship drive conducted by the TnP Cell; NIT Kurukshetra due to which I got the chance to apply for this position. We were welcomed onboard very warmly. Since the very first day, it didn't feel too tough to adjust there, thanks to the intern team. As a Full stack Developer-intern, I was required to

showcase my technical skills like: problem solving ability, development skills, code documentation, decision making and so on. I was so grateful to be able to work with wonderful developers throughout the internship who helped me enhance my skills.

ACKNOWLEDGEMENT

With the successful completion of the internship under the stipulated time, I would like to take this opportunity to present my wholehearted compliments, with high regards and warm thanks to one and all, who played an integral role and presided over this period. I would like to grab this opportunity to express my gratitude to all the individuals for their keen devotion without whom this endeavor would not have been a resounding success. The Full stack developer Intern experience at Alorb Technology was offered with an

incomparable amount of learning and provided sudden but welcome exposure to the IT industry and corporate world. Therefore, I feel indebted to be offered an opportunity to be a part of the company. I was engaged in interacting with outstanding developers and gaining expertise in new technology. It is my radiant sentiment to place on record my best regards, deepest sense of gratitude to my industrial mentor and Founder of the company, Mr. Javed Sheikh for his guidance during the internship. I would like to express my indebtedness appreciation to my faculty mentor ----------------, Professor (Electrical Engineering Department, NIT Kurukshetra) for his valuable support, guidance and much needed help that he readily provided in case of all internships related formalities and queries. I would also like to thank my colleagues and team members for their collaboration and knowledge sharing. Most importantly my family and friends who have always believed in me. Thank you all for being an integral part of my internship experience

#1   INTRODUCTION

1.1 About Alorb Technology Pvt. Limited

In the dynamic landscape of technological advancement, Alorb Technology stands as a beacon, bringing people together through an array of connected devices and innovative solutions. Our vision is rooted in the pursuit of a smart, secure, and sustainable future, where the immense potential of technology is harnessed to create a brighter world for generations to come.

• Founded by an enthusiastic and passionate group of engineers and management professionals hailing from the prestigious Indian Institute of Technology, Bombay (IIT Bombay), Alorb is more than just a technology company. With our hearts in the right place, we channel our expertise and talent to address modern-day challenges through advanced research, innovative solutions, and cutting-edge technology.

• At Alorb, collaboration is at the core of our ethos. We believe in harnessing collective brilliance to achieve excellence. We actively seek partnerships with visionary companies, dynamic startups, discerning investors, and ambitious entrepreneurs who share our commitment to innovation.

• Our journey is not just about building technology; it's about building a community of like-minded individuals and organizations who are dedicated to pushing the boundaries of what is possible. Alorb serves as a hub where ideas flourish, collaborations thrive, and solutions emerge that pave the way for a brighter future.

1.2 About my role in the company

• I am highly grateful to T&P Cell, NIT Kurukshetra, which helped me to go through the on-campus internship. I got

hired as a web Developer -intern @Alorb Technology. During the internship, we were engaged through the online mode, mostly via google meets.

 • During the initial days, I realized the most important thing is that being an intern or a grad we are not judged based on having comprehensive knowledge, instead companies look for the one with an attitude of learning new things with high motivation.

• In the initial phase of my internship, I was tasked with developing a comprehensive web page designed to facilitate the efficient handling of student complaints within the hostel management system.

#2   Project 1: HOSTEL MANAGEMENT

This was the first project that I was involved in as the SDE-intern. It included a Hoste Management system with a complaint box integrated in it. I will be explaining the details in the following subsections which are as follows:

- (2.1) Aim of the project: it will contain an overview to the project
- (2.2) Features: this section contains the features of the project.
- (2.3) Progress: this will include the complete project progress which basically will comprise writing down the requirements, understanding APIs, testing and making some rough UI flow diagrams.
- (2.4) Learnings: finally, I will come up with the improvements I felt in me and the things I learnt during this project.

2.1 Aim of the Project

The Hostel Grievance Redressal System is a web application aimed at simplifying the process of handling resident grievances within hostile environments. It provides residents with a user-friendly platform to report issues promptly, while offering administrators efficient tools for tracking and resolving these grievances.

Through its intuitive interface, residents can submit various concerns, from maintenance issues to behavioral conflicts. Administrators, on the other hand, can utilize the system to prioritize and manage reported grievances effectively, ensuring timely resolution and maintaining transparency throughout the process.

2.2 Features

- User-friendly Interface: Simple and intuitive design for easy grievance submission by residents.
- Real-time Updates: Residents receive real-time updates on the status of their submitted grievances.
- Admin Dashboard: An administrative dashboard to manage and prioritize grievances effectively.

2.3 Requirements

Frontend with React.js and Tailwind CSS:
The front end of the Hostel Grievance Redressal System is constructed using React.js, a popular JavaScript library for building user interfaces. React.js enables the creation of a responsive and dynamic UI, allowing users to interact seamlessly

with the application. The user interface is styled using Tailwind CSS, a utility-first CSS framework that provides a modern and customizable design system. Tailwind CSS offers a vast array of pre-built components and utilities, facilitating the development of a visually appealing and consistent user experience across different devices and screen sizes.

Backend with Node.js and Express.js:
The backend of the system is powered by Node.js, a versatile runtime environment for server-side JavaScript applications. Node.js enables developers to build scalable and high-performance server applications, making it an ideal choice for handling the backend logic of the Hostel Grievance Redressal System. Express.js, a minimalist web framework for Node.js, is utilized to streamline the development of robust and efficient APIs and middleware. Together, Node.js and Express.js provide the foundation for handling HTTP requests, processing data, and interacting with the database.

Database with MongoDB:
The Hostel Grievance Redressal System employs MongoDB as its database solution. MongoDB is a NoSQL database known for its flexibility and scalability. Its document-oriented structure allows for easy adaptation to changing data models without the need for predefined schemas. MongoDB's distributed architecture ensures efficient data storage and retrieval, making it suitable for applications with growing datasets and high throughput requirements. Additionally, MongoDB provides robust security features and support for advanced querying and analysis, enabling the system to manage resident grievances, user accounts, and administrative tasks effectively while maintaining data integrity and confidentiality.

Component Library Preline, ComponentLand:

The project utilizes Component Library Preline and ComponentLand for various UI elements such as cards, pages, and other components. These libraries offer a collection of pre-designed and customizable components that expedite the development process and ensure consistency in the application's design. By leveraging these component libraries, developers can focus on building core functionality while benefiting from ready-made solutions for common UI patterns and elements. This approach enhances productivity and maintains design coherence throughout the Hostel Grievance Redressal System. data integrity and confidentiality.

2.4 Frontend and UI

Complaints

Switch is not working
Created on Dec 15, 2023
Completed on Dec 15, 2023, 1:49:02 PM

I am facing issues with the switch in my room. It is not
functioning correctly. I will be there after 1:30PM

[Completed]

Hostel Grievance Redressal
Submit Your Grievance

Hostel Grievance Redressal ensures a swift and confidential resolution of
student concerns. We guarantee a quick response to submitted complaints,
fostering a secure and comfortable living environment for all hostel residents.

Swift Grievance Resolution
Swift grievance resolution prioritizes timely and effective solutions,
ensuring students' concerns are promptly addressed and resolved.

Confidentiality Assured

Submit Complaint   [Quick Response]
Contact us for hostel grievance redressal

[Enter Complaint name]

[Enter your Room No.]

Tell us about your grievance

Complaints

Switch is not working (Room No.L block - 27)
Created on Dec 15, 2023
Completed on Dec 15, 2023, 1:49:02 PM

I am facing issues with the switch in my room. It is not
functioning correctly. I will be there after 1:30PM

[Completed] [Delete]

Complaints

Switch is not working (Room No.L block - 27)
Created on Dec 15, 2023

I am facing issues with the switch in my room. It is not
functioning correctly. I will be there after 1:30PM

[Not Completed] [Delete]

Complaints

Switch is not working
Created on Dec 15, 2023

I am facing issues with the switch in my room. It is not functioning correctly. I will be there after 1:30PM

Not Completed

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Confidentiality Assured

Submit Complaint Quick Response
Contact us for hostel grievance redressal

Enter Complaint name

Enter your Room No.

Tell us about your grievance

Complaints

No complaints registered yet.

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Confidentiality Assured

Your grievances are handled with utmost confidentiality, ensuring privacy and trust throughout the hostel grievance redressal process .

Easy Communication

Effortless communication is facilitated, providing a smooth and accessible channel for expressing and resolving grievances within the hostel community.

Submit Complaint Quick Response
Contact us for hostel grievance redressal

Switch is not working

L block - 27

Tell us about your grievance

I am facing issues with the switch in my room. It is not functioning correctly. I will be there after 1:30PM

Submit

Profile

Name	Chinmay Ankolekar
Email	ankolekar.chinmay@gmail.com
Phone	8277793239
USN	01JST21IS001
Block ID	1
Block Name	L
Room	27

Back

Complaints

No complaints registered yet.

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Submit Your Grievance

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Submit Complaint Quick Response

Contact us for hostel grievance redressal

Enter Complaint name

Enter your Room No.

Tell us about your grievance

Submit

Signup.

Welcome!

Please sign-in to access your account

FULL NAME

Enter your full name

EMAIL

Enter your email

PHONE NUMBER

Enter your phone number

BLOCK ID

Enter your Block ID

ROOM

Enter your Room

USN

Enter your USN

ROLE

Warden Student

PASSWORD

....

Sign in

Already have an account? Login

Login.

Welcome!

Please sign-in to access your account

EMAIL

Enter your email

PASSWORD

....

Sign in

Don't have an account yet? Create an account

2

2.5 Backend

Introduction:

The backend of our MERN application serves as the robust infrastructure, seamlessly integrating MongoDB, Express.js, Node.js, and React.js. With a focus on scalability and security, it orchestrates critical tasks, including user authentication and data management. Leveraging Express.js for efficient routing and Node.js for server-side logic, the backend ensures a seamless connection with the frontend. Authentication is a central feature, implemented securely to safeguard user data. MongoDB, as our NoSQL database, provides flexibility in data storage and retrieval. This backend architecture forms the foundation for a dynamic, responsive, and secure MERN application.

Technology used:

1) EXPRESS JS:

 An Express.js application, which serves as a backend for a system related to student accommodation. It includes middleware for handling complaints, students, warden, workers, and user-related routes. Additionally, it incorporates security features such as CORS (Cross Origin Resource Sharing) and authorization middleware. It includes the cors middleware to handle cross-origin requests. It uses "bcrypt" for password hashing and cookie-parser for parsing HTTP request cookies. It utilizes cookie-parser middleware. The application utilizes CORS middleware to handle cross-origin requests and parses incoming JSON data. It utilizes the express Router to create a modular and organized structure. The routes are designed to perform various actions related to complaint management, such as creating, retrieving, updating, and deleting complaints. Additionally, there are routes for obtaining user-related information. Routes are defined for:

• Creating a new complaint using HTTP POST at the '/complaints' endpoint.
• Retrieving all complaints related to a user using HTTP GET at the '/complaints' endpoint.
• Updating a complaint by ID using HTTP POST at the '/complaints/:id' endpoint.
• Obtaining user type information using HTTP GET at the '/userType' endpoint.
• Obtaining user details by ID using HTTP GET at the '/userDetails/:id' endpoint.
• Deleting a complaint by ID using HTTP DELETE at the '/complaints/:id' endpoint.
Validation check: It ensures that the required credentials are present, validates the

email format, and provides appropriate responses if any validation fails. This middleware can enhance the security and reliability of user registration and login processes within an Express.js application. a set of middleware functions designed to authorize access to specific routes based on user roles (warden, worker, student). Additionally, there is a general-purpose middleware for complaint routes. These middleware's use JSON Web Tokens (JWT) for authentication and authorization, verifying the token's validity and the user's role before granting access. Additionally, the middleware includes logging statements for debugging and error handling. best practices by using asynchronous handling, middleware for error handling, and modular organization of routes and middleware. Additionally, it utilizes the express async-handler library to simplify error handling in asynchronous routes.

2.DATABASE

• MongoDB, as the chosen database for our MERN application, employs a NoSQL document-oriented model, allowing for flexible and dynamic data structures.
• The BSON (Binary JSON) format enhances storage and retrieval efficiency, aligning seamlessly with JavaScript technologies like Node.js and Express.js on the backend.
• The schema-less nature of MongoDB accommodates evolving application requirements, providing adaptability without the constraints of traditional relational databases.
• MongoDB's horizontal scaling capabilities and automatic sharding ensure optimal performance, supporting the growth of our application and maintaining responsiveness as the user base expands.
• The ability to store complex data structures and support nested documents facilitates streamlined interactions between the backend and frontend components.
• Robust querying capabilities and geospatial data support empower our application to execute diverse and complex queries efficiently.
• Comprehensive indexing features contribute to improved query performance, enhancing overall responsiveness for a seamless user experience.
• MongoDB stands as a foundational element in our MERN stack, providing scalability, flexibility, and performance to meet the evolving demands of our dynamic web application.

DATABASE SCHEMA
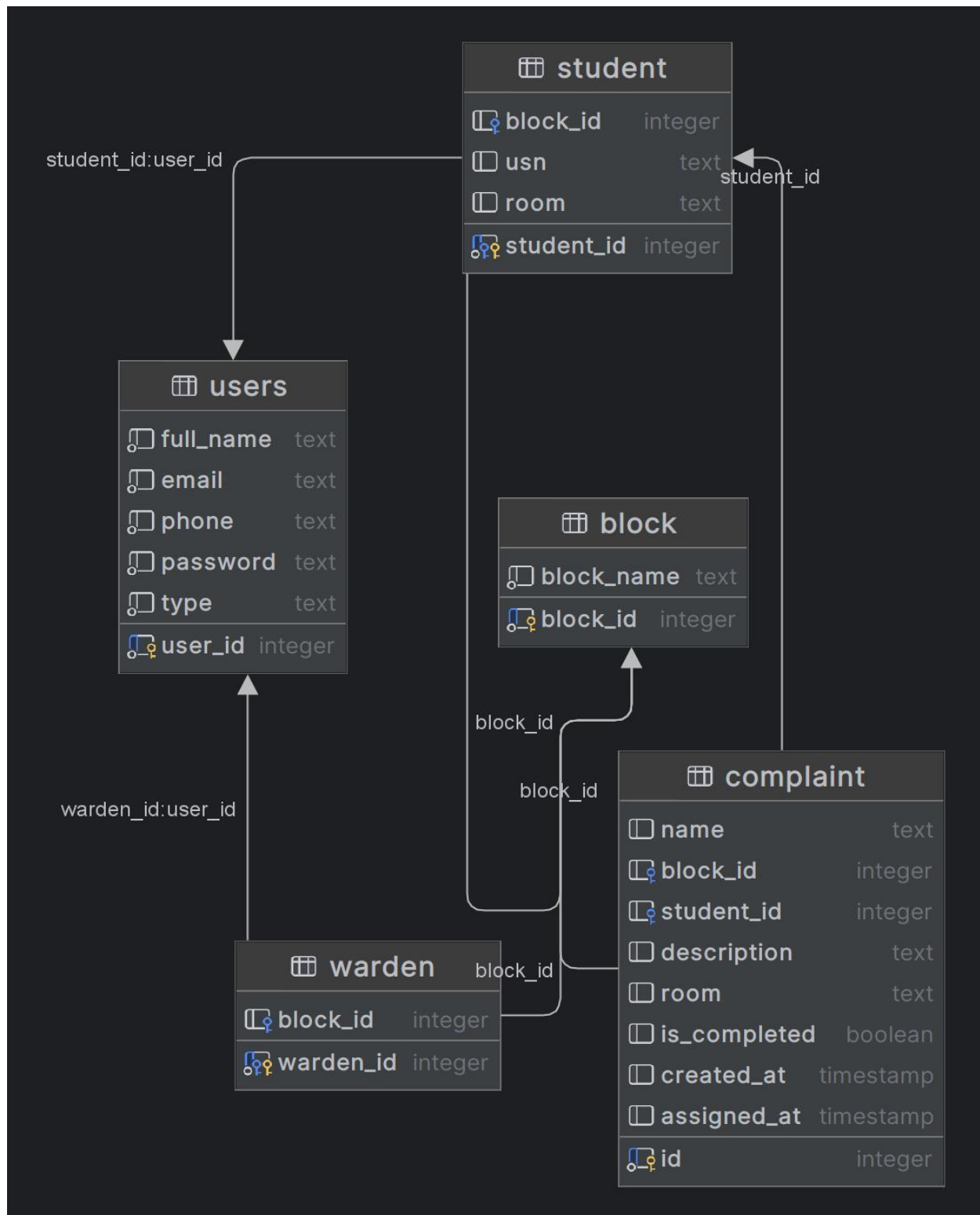
2.6 Testing Tools

2.6.1 MongoDB Compass

Overview:
MongoDB Compass is utilized for database management and validation within the Hostel Management System. It offers a graphical interface to interact with MongoDB databases, allowing for efficient querying, data visualization, and validation.

Functionality:

MongoDB Compass enables the following key functionalities:

- **Data Visualization:**
  MongoDB Compass provides visual representations of database schemas, collections, and documents, facilitating easy navigation and exploration of data structures.

- **Querying and Filtering:**
  Users can execute complex queries and apply filters to retrieve specific data subsets based on predefined criteria.

- **Data Validation:**
  MongoDB Compass allows users to validate data integrity by visually   i nspecting documents, identifying inconsistencies, and ensuring adherence to predefined schemas.

- **Validation Process:**
  During the testing phase, MongoDB Compass is used to validate the following aspects of the Hostel Management System:

- **Data Consistency:**
  Ensure that data stored within MongoDB collections aligns with predefined schemas and business logic.

- **Data Retrieval:**
  Validate the accuracy and completeness of data retrieval operations, including complaint submissions, user profiles, and administrative records.
- **Indexing and Performance:**

Analyze query performance and optimize indexing strategies to improve data retrieval efficiency and overall system performance.

Benefits:
MongoDB Compass provides a user-friendly interface for database management and validation, reducing the complexity of interacting with MongoDB databases.
Its visual tools and querying capabilities streamline the validation process and enable quick identification of data anomalies and inconsistencies.
By leveraging MongoDB Compass, testers can ensure data integrity, optimize query performance, and enhance the overall reliability of the Hostel Management System.

2.6.2 Postman

Overview:
Postman is utilized for API testing within the Hostel Management System. It offers a comprehensive platform for designing, testing, and documenting APIs, enabling testers to validate API functionality and performance.

Functionality:
- Postman offers the following key functionalities for API testing:

- Request Building: Users can easily create HTTP requests, including GET, POST, PUT, and DELETE methods, to interact with APIs and web services.

- Request Parameterization: Postman allows for parameterization of request payloads, headers, and authentication tokens, enabling dynamic and customizable testing scenarios.

- Response Validation: Testers can validate API responses against expected outcomes using assertions and scripting, ensuring data accuracy and conformance to specifications.

Testing Process:
- During the testing phase, Postman is used to perform the following tasks within the Hostel Management System:

- Endpoint Testing: Validate the functionality of API endpoints related to complaint submission, retrieval, update, and resolution.

- Request Validation: Verify the accuracy and completeness of request payloads, headers, and authentication mechanisms used in API interactions.

- Response Verification: Ensure that API responses meet predefined criteria, including data integrity, status codes, and error handling.

Benefits:

Postman offers a user-friendly interface and intuitive workflow for designing and executing API tests, reducing testing effort and accelerating the development cycle. Its robust features for request parameterization and response validation enable testers to create dynamic and comprehensive test scenarios, covering a wide range of use cases.
By leveraging Postman, testers can identify, and address issues related to API functionality, performance, and security, ensuring the reliability and scalability of the Hostel Management System's backend services.